Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Planet Project**

It’s no secret that humans are rapidly polluting Earth, and we are facing many threats that may lead us to consider off-Earth living arrangements, not necessarily in the distant future. The amount we consume each year already far outstrips what our planet can sustain, and the World Wildlife Fund estimates that by 2030 we will be consuming two planets' worth of natural resources annually. The Center for Research on the Epidemiology of Disasters, an international humanitarian organization, reports that the onslaught of droughts, earthquakes, epic rains and floods over the past decade is triple the number from the 1980s and nearly 54 times that of 1901, when this data was first collected. Some scenarios have climate change leading to severe water shortages, the submersion of coastal areas, and widespread famine. Given the risks humans pose to the planet, we might also someday leave Earth simply to conserve it, with our planet becoming a kind of nature sanctuary that we visit now and again, as we might visit Rincon de la Vieja National Park.

If we leave Earth, where should we go? We will conduct detailed research of the planets in our solar system, report our findings to each other, and determine as a class what our best option for an alternative planet to live on is.

This project is compiled of the following three parts:

**Part 1: Research and make planet books.**

* Conduct research on suggested websites and create a book including the information outlined on the following pages.

**Part 2: Present information on planets**

* Prepare a ten minute overview of the information you learned about your planet to present to the class.

**Part 3: Create a model of your planet that will be used to construct a small to-scale model of the distances in our solar system on the futbol field**

|  |  |  |
| --- | --- | --- |
| **Due Date** | **Pacing: Deadlines for component completion** |  |
| Monday 6/12 | Decide who will be responsible for researching which questions. (This will depend on how many people are in your group). Start research! |  |
| Tuesday 6/13 | Continue researching questions. |  |
| Thursday 6/15 | Continue researching questions. |  |
| Friday 6/16 | Final day to research questions. |  |
| Monday 6/19 | Work on turning research questions into a book to present. |  |
| Tuesday 6/20 | Work on turning research questions into a book to present |  |
| Thursday 6/22 | Work on turning research questions into a book to present. |  |
| Friday 6/23 | Final day to work on making books. |  |
| Monday 6/26 | Books are due today. Prepare and practice presentations. |  |
| Tuesday 6/27 | Presentation Day! |  |
| Thursday 6/29 | Start planning for small scale models. |  |
| Friday 6/30 | Work on models. |  |
| Monday 7/3 | Work on models. |  |
| Tuesday 7/4 | Models are due. Make a scaled solar system on the futbol field. |  |

**Part 1: Research and make planet books.**

The following information must be included in your planet book in order to receive full credit:

1. Name of your planet
2. Mythological origin of your planet's name
3. Order of this planet from the sun (first, second, etc.)
4. Average distance from the sun in miles, kilometers, and astronomical units
5. Period of rotation (length of day)
6. Period of revolution (length of year)
7. Average density, g/cm3. Compare the average density of your planet with Earth's average density. What percent of Earth's density does your planet have?
8. Temperature range, high and low (Fahrenheit and Celsius)
9. Diameter in miles and kilometers. Compare the diameter of your planet with that of Earth. What percent larger or smaller is your planet than Earth?
10. Compare the gravity of your planet with Earth's gravity. What percent of Earth's gravity does your planet have? If an object weighed 100 pounds on Earth, how much would it weigh on your planet?
11. List the most common elements present and their physical state (solid, liquid or gas)
12. Describe the atmosphere (if any) on your planet. List the gases present and their percentages.
13. How many moons does your planet have? Describe any unique features found on your planet's moons. What are the names of your planet's moons? (If your planet has more than five moons, just name five major moons.)
14. What probes have been sent or are planned to be sent to your planet? Include names of the missions, when they were sent or are planned to be sent. What information have they found out about your planet?
15. What does your planet look like? Describe its surface features, such as volcanoes, craters or canyons. Does your planet have rings? Describe the rings.
16. Based on what you have learned, do you think life could exist on your planet? Think about what conditions a living organism would have to adapt to in order to survive on your planet when answering your question. Remember, life doesn't necessarily mean life as we know it on Earth!

Recommended research websites:

<http://solarsystem.nasa.gov/planets/index.cfm>

<http://pds.jpl.nasa.gov/planets/>

<http://www.windows2universe.org/>

<http://nineplanets.org/>

<http://www.enchantedlearning.com/subjects/astronomy/planets/>

<http://www.space.com/56-our-solar-system-facts-formation-and-discovery.html>

<http://airandspace.si.edu/exhibitions/exploring-the-planets/online/>

<http://www.exploratorium.edu/ronh/weight/>

<http://science.nationalgeographic.com/science/space/solar-system?2d>

**Part 2: Present information on planets in class**

The following information must be included in your presentation. Read carefully, because the information is slightly different then the questions for your booklet:

1. Name of your planet
2. Can we see your planet from Costa Rica? If we can see it now, point it out. If we can’t see it now, when can we see it? If we can’t see it, why not?
3. Mythological origin of your planet's name
4. Order of this planet from the sun (first, second, etc.)
5. Average distance from the sun in miles, kilometers, and astronomical units
6. Period of rotation (length of day)
7. Period of revolution (length of year)
8. What percent of Earth's density does your planet have?
9. Temperature range, high and low (Fahrenheit and Celsius)
10. What percent larger or smaller is your planet than Earth?
11. What percent of Earth's gravity does your planet have? If an object weighed 100 pounds on Earth, how much would it weigh on your planet?
12. Describe the atmosphere (if any) on your planet.
13. How many moons does your planet have? Describe any unique features found on your planet's moons. What are the names of your planet's moons? (If your planet has more than five moons, just name five.)
14. What does your planet look like? Describe its surface features, such as volcanoes, craters or canyons. Does your planet have rings? Describe the rings.
15. Based on what you have learned, do you think life could exist on your planet? Could humans inhabit it? How would we have to adapt?

**Part 3: Create a “to-scale” model of your planet that will be used to construction a small scale model of our solar system on the futbol field**

We will create 2-D models of our planets on poster paper including its special surface features, rings (if any) and moons if any. We will try and make our models “to-scale” as much a possible.

Although the Sun looks small from Earth, it is really much, much bigger than our planet (and any other planet in the solar system). As you know by now from your studies, the Earth is actually one of the smaller planets compared to the giant planets in the outer solar system – Jupiter, Saturn, Uranus and Neptune. The table below lists the diameters of the planets and the Sun compared to the Earth.

|  |  |
| --- | --- |
| **Body** | **Diameter** |
| Sun | 109 |
| Mercury | .38 |
| Venus | .95 |
| Earth | 1 |
| Mars | .53 |
| Jupiter | 11.19 |
| Saturn | 9.40 |
| Uranus | 4.04 |
| Neptune | 3.88 |
| Pluto | .18 |

1.For the purposes of creating a “to-scale” model of the solar system for class, Earth is going to have a 7 cm diameter. Figure out the diameter of your planet. Show your work:

2. Create a flat model with the “to-scale” diameter you calculated. (You should check in with me first to make sure that your calculations on your diameter are correct). Make sure you depict any surface features, or special attributes in your model.